W. H. Hubbell,

Spark Arrester,

No. 2,144, Patented June 26, 1841.

Fig: 1

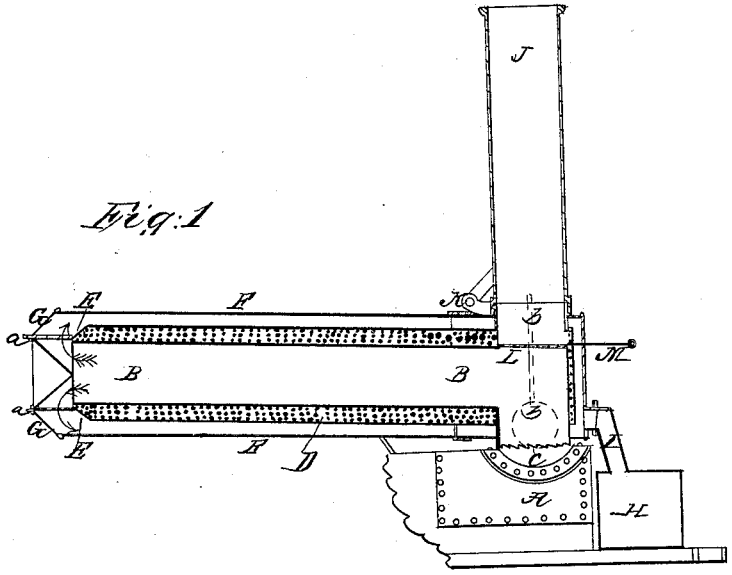
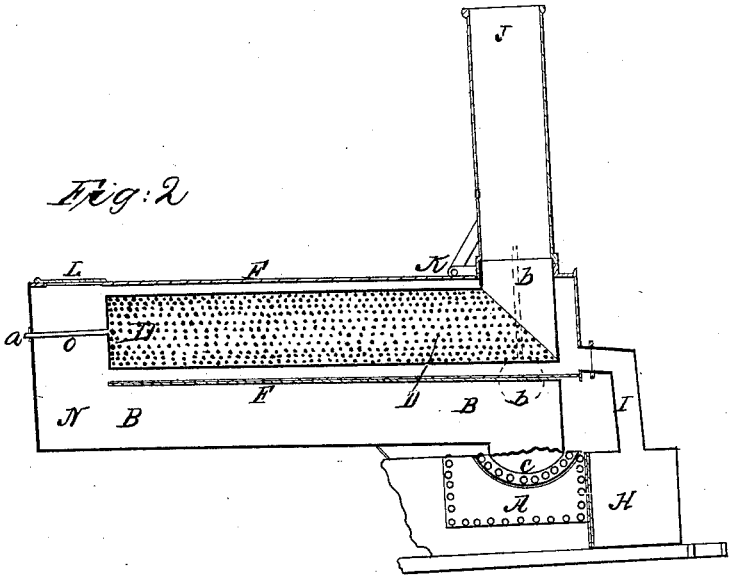


Fig: 2



UNITED STATES PATENT OFFICE.

WM. W. HUBBELL, OF MOYAMENSING, PENNSYLVANIA, ASSIGNOR TO LEONARD PHLEGER.

SPARK-ARRESTER FOR LOCOMOTIVE STEAM-ENGINES, &c.

Specification of Letters Patent No. 2,144, dated June 26, 1841.

To all whom it may concern:

Be it known that I, WILLIAM W. HUBBELL, of Moyamensing, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in the Manner of Constructing Spark-Arresters to be Used on Locomotive and other Steam-Engines, which improved instrument I denominate the "Horizontal Spark-Arrester;" and I do hereby declare that the following is a full and exact description thereof.

On rail-roads that are crossed by low bridges, great difficulty has been experienced in the use of spark arresters, they having hitherto been placed in a vertical position, and the chimneys to which they are attached have, necessarily, extended to such height as to render them inadmissible, or extremely inconvenient, where there are low bridges on a rail-road; they are sometimes so made that the chimneys may be turned down, but where the arresting apparatus is at the upper part of the chimney, the turning down, or depressing, cannot, in many cases, be effected, and is in all extremely inconvenient. To obviate this difficulty I have combined a horizontal spark arrester and flue with a vertical chimney, which chimney may, in most cases, be made so short as not to require to be turned down; but which may, if desired, be attached to the part constituting the arrester, by a hinged joint, and may then be turned down with facility. The horizontal flue that is combined with the spark arrester may be considered as constituting a part thereof; and it is likewise to be considered as forming a part of the chimney; this horizontal flue I sometimes surround by the perforated sheet metal, or by wire gauze, by which the sparks are to be arrested; and sometimes I place it below, or alongside of, a separate cylinder containing the perforated metal, or wire gauze. Examples of both these modes of arrangement are given in the accompanying drawings, which I will proceed to explain by suitable references thereto.

Figure 1, is a sectional representation of the horizontal spark arrester, with the horizontal flue contained within the perforated metal cylinder for arresting the sparks. A, is a part of the smoke box, and B, B, the horizontal flues attached to it by an elbow at C. This horizontal flue is surrounded by a cylinder D, D, of perforated metal, or of woven wire, and the two are united together by a metal plate, or annular ring, at E, E. The cylindrical outer case F, F, which surrounds the perforated metal, is inclosed at its end by a cap G, G; and *a*, *a*, are screw-bolts, by which the cap and case may be attached to D, D. The sparks and ashes are to be deposited in the receptacle H, through the tube I, leading into it from the space between the outer case and the perforated cylinder. The vertical chimney J, may be made so short as to pass readily under the lowest bridges; if made longer, it may be hinged at its lower end, as at K, so that it may be readily turned down. The dotted lines *b*, *b*, represent balance balls and rods, which may be attached to the chimney when jointed, to keep it in place. The course of the draft will be apparent to any one acquainted with the construction of spark arresters. It first passes along the flue B, B, toward the cap G, G, which is represented as made in such a form as will tend to conduct it into the space between F, and D, whence it passes through the perforations in D, into the space between it and B, which opens directly into the chimney J. The sparks are detained on the outside of D, fall to the bottom of the space surrounding it, and are urged forward by the draft, and pass through I, into the receptacle H. There is a valve, or sliding shutter, L, governed by the rod M, which shutter when pushed back leaves an opening in the top of the flue B, B, by which the draft may be admitted directly from the furnace into the chimney.

In Fig. 2, I have shown the manner of arranging the horizontal spark arrester with the horizontal flue below the cylinder containing that of perforated metal. In both these figures, the corresponding parts are designated by the same letters of reference. In this latter arrangement, the cylinder F, F, and the perforated cylinder contained within it, may each be of smaller diameter than under that first described. The draft from the fire, in this modification of the apparatus passes along the cylindrical flue B, B; and this, at its end N, has an open communication into the end O, of the cylinder F, F; into the space between which and the perforated cylinder D, D, it passes, and thence through the perforations in said cylinder, and into the

chimney J; the cylinder D, and that constituting the chimney being united together at right angles, in the manner of an elbow pipe, or in any other convenient way. The sparks and ashes are forced forward and deposited in the receptacle H, in the same manner as under the first modification. An opening may be made on the upper side of the cylinder F, F, and be furnished with a shutter, as at L, to allow of the escape of the draft when the steam engine is not in operation. The exhaust steam is, under either modification, to be conducted into the flues B, B, to increase the draft, in the ordinary way.

Having thus fully described the nature of my combined horizontal spark arrester and vertical chimney, and shown the operation thereof, what I claim therein and desire to secure by Letters Patent, is—

The combining of a spark arrester, placed in a horizontal position, with a vertical chimney, substantially in the manner set forth, for the purpose of obtaining the necessary length of flue, and of perforated metallic surface for the proper action of the instrument, while the vertical chimney itself may be so short as to pass under the lowest bridges upon rail-roads.

WM. W. HUBBELL.

Witnesses:
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